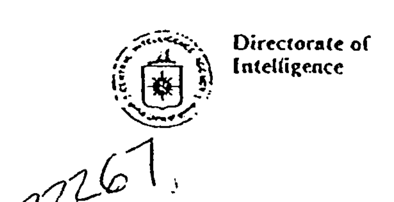

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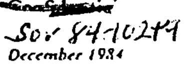
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The Nutrient Content of the Soviet Food Supply

A Research Paper

This paper was prepared by Office of Soviet Analysis with the technical support of the Human Nutrition Information Service, US Department of Agriculture


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Preface

Western researchers have paid considerable attention to the economic and political issues associated with the imbalances between the supply of and demand for livestock products and other quality foods in the Soviet Union. Over the last two decades, growth in discretionary income and the maintenance of low and increasingly subsidized retail prices, along with greater awareness of the better availability and variety of foods in the West and in some East European countries, have pushed up Soviet consumer demand for high-quality foods. Although the composition of the food supply has changed somewhat to reflect consumer preferences, the Soviet Union has not solved the economic problem of providing a food supply that matches consumer preference.

Little research, however, has been devoted to a parallel but separate issue, the nutrient content of the Soviet food supply. The Soviet Union does not publish systematic data on per capita levels of calories and nutrients. Nor does it provide in any one source the sufficiently detailed breakdown of food availability by type necessary to do an accurate nutrient composition series. Undertaken as a contribution toward filling this gap in our understanding of Soviet consumer welfare, this paper presents the results of research conducted jointly by the Office of Soviet Analysis of the Directorate of Intelligence and the Human Nutrition Information Service of the US Department of Agriculture. Using a broad range of Soviet sources, the Office of Soviet Analysis prepared detailed data on per capita food availability consistent with USDA methodology. The Human Nutrition Information Service, which conducts the annual nutrient analysis of the US food supply, provided the technical analysis of this data.

The study presents calculated levels of 25 nutrients and food components (including calories, protein, carbohydrates, fat, fatty acids, vitamins, and minerals) in the Soviet food supply. To provide a frame of reference, the per capita levels of nutrients in the Soviet food supply are compared with US data based on comparable methodology. We must emphasize, however, that the data presented for both countries represent per capita levels of nutrients in the *food supply, not their actual ingestion,* which is lower because of losses in food and nutrients after the point of measurement of the food supply. In addition, the per capita levels of nutrients in the Soviet food supply as measured in this study likely cover a wide spectrum of averages for regions and subgroups

Because the quality and nutrient content of the Soviet food supply relate to public health and to consumer welfare and satisfaction, we also discuss the implications of our findings in these areas. Alterations in traditional nutrition patterns may be associated with changing trends in Soviet mortality, especially among Soviet men of able-bodied ages.



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The Nutrient Content of the Soviet Food Supply

Summary

Information available as of 30 November 1984 was used in this report.

The nutrient content of the Soviet food supply resembles that of the US food supply in many respects. The per capita level of food energy (calories) nearly matches that in the United States. The protein level also nearly equals that of the US food supply. The level of carbohydrate remains higher, and that of fat lower, but the gaps have narrowed somewhat since 1965. In both countries—but especially in the USSR—the nutrients actually ingested by the population are less than the nutrients available in the food supply because of both quantitative and qualitative losses that occur in processing, distribution, and food preparation subsequent to the point of measurement. The data represent average per capita per day nutrient levels and do not indicate the differences that exist among various regions and population groups; these differences likely are more pronounced in the USSR than in the United States

Shifts in the structure and nutrient content of the Soviet food supply occurred from 1965 to 1981, largely as a result of the increased availability of livestock products. While the per capita level of food energy increased 6 percent, the level of protein increased 8 percent, and that of carbohydrate decreased 2 percent. The most pronounced change occurred in the per capita level of fat, which increased 26 percent during the period studied. The share of protein in the food supply from livestock products also increased markedly, from one-third to nearly one-half

The trends for the major nutrients within the period studied also varied considerably. Most of the changes occurred in the 1966-75 period. The per capita level of calories rose through 1978 and then declined slightly in the final two years examined in this study, mostly as the result of decreases in the use of milk and milk products, grain products, and potatoes. The most rapid rise in the calorie level took place during 1966-70. This period also accounted for nearly all of the rise in the protein level, which subsequently remained at the 1970 level with only small fluctuations. The level of carbohydrates also increased slightly in 1966-70 and then began to fall, also with some fluctuations. The level of fat held to a steadier pattern, rising through 1980 with only a minor decrease in 1981; it too, however, rose most rapidly between 1965 and 1975.

The Soviet consumer has wanted a diet of the kind that prevails in Western industrialized societies—one characterized by a relatively high intake of animal products. And, indeed, the Soviet leadership has attempted to accommodate this preference by giving priority for many years to the goal of providing more livestock products. As the availability of livestock products has increased, consumers have eagerly substituted them for the traditional starchy staples - potatoes and grain products.



For the most part, per capita levels of specific vitamins and minerals in the USSR's food supply are close to those in the United States. With one exception, the per capita levels of vitamins and minerals for most of the period studied are also above US or Soviet recommended dietary allowances. Because of the losses of food and nutrients occurring subsequent to the point of measurement of the food supply, however, satisfying the recommended dietary allowances (which are for nutrients in food as ingested) calls for higher per capita levels of nutrients in the food supply. How much higher cannot be stated, since the degree of loss before ingestion is unknown. Nonetheless, we believe that such losses are higher in the USSR than in the United States. Indeed, a primary objective of the Soviet Food Program is to improve the food production complex so as to reduce losses from waste and spoilage and to retain more of the nutrient value during food processing.

The findings of this study suggest that the impact of shortages of quality foods—items high on the Soviet consumer's scale of preferences—may be primarily on consumer satisfaction rather than on physiological need. The marked improvement in availability of meat, milk and milk products, and some fruits and vegetables that occurred through the mid-1970s enhanced consumer welfare in the USSR but also whetted consumer desire for further improvement. The findings, however, are not without implications for some public health issues. The relatively high level of calories and the rapid growth in the per capita level of fat may be related to changing Soviet mortality patterns, including the rapid increase in death rates from coronary heart disease among Soviet men of able-bodied ages. A high fat diet has also been associated with some forms of cance

Finally, the findings that the per capita levels of calories, protein, and most food components in the Soviet food supply are close to or exceed Soviet recommended dietary allowances (RDAs) suggest that a sound strategy is to eliminate waste and spoilage so as to increase the proportion of agricultural production reaching the consumer and maintain the nutrient level of the foods actually ingested. The food supply is basically adequate in nutrient levels and could be augmented through loss reduction. An investment approach aimed at reducing losses in harvesting, transport, and storage, and at raising the efficiency of food processing (important components of the May 1982 Food Program) thus probably would be more cost effective in increasing the nutrient content of the food supply than a strategy of increasing gross agricultural output, especially given the recent difficulties the Soviet farm sector has experienced.

Nonetheless, the Food Program is designed to increase the output of nearly all agricultural commodities. The current production of some foods, notably meat and fruit, is still not sufficient to satisfy consumers even if all losses between farm and consumer are eliminated. Moreover, population growth necessitates production growth simply to maintain per capita availabilities, and the Soviet leadership would like to reduce if not eliminate food imports.

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The Nutrient Content of the Soviet Food Supply

Methodology

This study was structured to examine the nutrient content of the Soviet food supply and to facilitate comparison with measurements of the nutrient content of the US food supply. Every effort was made to array information on the Soviet diet in a manner consistent with the methodology employed by the Human Nutrition Information Service of the US Department of Agriculture.[1]

The US Food Supply

US food supply data prepared by the Economics Research Service of USDA represent the amounts of food that "disappear" into the food distribution system. They are derived by deducting data on exports, military use, yearend inventories, and nonfood use from data on production, imports, and beginning-of-the-year inventories. Because of the complexity of the food distribution system, consumption is measured at different stages of processing and distribution, from the raw or primary state to the retail product. Food losses that occur subsequent to the point of measurement (that is, in processing, marketing, and home use) are not taken into consideration. Therefore, estimates of the nutrient content of the US food supply are not intended to measure actual food ingestion by specific age-sex groups, but rather to serve as a valuable tool in assessing long-term trends in food and nutrient levels.

The Soviet Food Supply

The measurement of the Soviet food supply is also based on the "disappearance" concept, that is, the amount of food disappearing into the food distribution system. Our data development on the Soviet food supply began with Soviet statistics on per capita consumption of 10 general categories of food products. The data to a large extent represent food in unprocessed form. These Soviet data were cross checked (as far as data allowed) for consistency between availability for human consumption on the one hand, and production, net trade, and other end uses on the other hand. These consumption data, in kilograms or other physical units, have been published regularly since 1965.[2] They are based on a variety of sources, principally on balances of the supply and uses of agricultural products and on periodic family budget surveys. While the latter have been criticized by other Soviet sources for lack of representativeness, the results they give, according to Soviet statements, are checked against availabilities given by the product balances. Consumption of some food items—honey, yeast, tea, and margarine—not included in the 10 categories of food were developed from Soviet production and trade data.[3]

Although the absolute levels of food availability in any one year must be used with great care in international comparisons because of definitional problems (which were addressed in subsequent steps in our data development), the data are considered reliable indicators of trend. They are reasonably consistent with statistics for production, intermediate uses, changes in inventories, and net imports. Some data series, however, may be less reliable than others. For example, potatoes and vegetables, large shares of which are produced by the private sector and which are used for animal feeds, are more difficult to check for consistency between production and their various uses.

[1] More highly aggregated data on Soviet food consumption is used by the United Nations Food and Agriculture Organization in its production yearbook. The FAO methodology, which estimates per capita intake of 12 nutrients, has produced some results that differ from this study; caloric consumption, for example, is estimated by the FAO to be considerably higher. Using FAO data, the World Bank calculated the per capita per day level of calories in the USSR in 1981 to be 30 percent above the per capita recommended dietary allowance. *World Development Report 1984.*

[2] The method of calculating the physical measures of per capita consumption is described in *Vestnik statistiki*, No. 2, 1968, pp. 46-50. The more detailed methodology for calculation of consumption data by the Central Statistical Administration is set forth in "Instruktsiya po raschetu fondov potrebleniya naseleniyem oblastey, krayev i ASSR," *Upravleniye balansa narodnogo khozyaystva*, Moscow, 1972.

[3] Vegetable oil consumed in margarine is not included in Soviet per capita consumption statistics.

Accounting for Losses in the Soviet Food Supply

Soviet methodology in calculating food balances accounts for losses at some stages subsequent to harvesting.[4] Discounts are made for losses on the farm during initial processing, storage, and further processing (if such processing takes place in an enterprise on the farm). Soviet-calculated balances, however, generally do not take account of losses that occur between delivery of products from the farm to other enterprises or losses that occur in off-farm processing. Because our methodology, wherever possible, converted Soviet data given in terms of unprocessed foodstuffs to an industrially processed basis (see next section), some of the losses during manufacturing were captured. Soviet data on food balances also incorporate at least partial allowances for the household feeding of bread, other grain products, and several other foods to privately owned livestock, as well as for some food waste that takes place in the home.

Because some losses in transport and processing are the result of theft rather than spoilage (and thus remain a component of food consumption), we did not apply further across-the-board discounts for food losses. Genuine losses of food do, of course, occur in the Soviet transport and manufacturing systems, but we have provided no adjustment for these. The impact of the resulting error on our estimate of the Soviet food supply in terms of the US measurement concept is offset to some small extent by the adjustment present in Soviet data for household losses—an adjustment not made in calculation of the US food supply.

No adjustments could be made, however, for the nutrient losses in fresh foods arising from poor Soviet storage procedures. To some extent, however, our inability to discount for nutrient losses in storage was at least partially offset, because no upward adjustments were made for the limited enrichment of foods that takes place in the Soviet Union.

Other Adjustments to Data

Particular attention was paid to the necessity of discounting and/or adjusting Soviet data to account for processing practices different from those in the United States. Soviet technical handbooks and industry serial publications were used to obtain the specific information necessary for these detailed calculations.

For example, Soviet data on per capita whole-milk availability had to be adjusted downward because much of the nutritionally valuable byproducts of butter and cheese production included in these data actually are discarded or used for animal feed. Similarly, official Soviet statistics on meat consumption had to be adjusted to account for the slaughter fat included in these statistics, so these amounts would be counted as fat, not meat.[5] Additional adjustments were made for edible offals included in Soviet meat consumption statistics so that their specific nutrient values could be included. Margarine consumption was adjusted downward to account for animal fat used in its production (to avoid double counting of animal fats included in the animal fat category.) Slaughter fat from cattle was adjusted downward to account for production of tallow.

In addition, because Soviet food-use numbers for most categories of foods are given in terms of fresh, unprocessed equivalents (even though some food is purchased by the consumer in processed form), it was necessary to recalculate the amounts of food available for consumption in fresh form. Soviet food processing is generally less efficient than in the United States, using more raw material per unit of output. Therefore, reported industrial output for as many food products as possible was located, and the amounts of various unprocessed foods required to produce these processed foods were calculated (taking account of the lesser Soviet efficiencies). The amounts of unprocessed foods required to produce processed foods were then subtracted from the Soviet-presented food-use numbers to obtain the food amounts actually available to the consumer in unprocessed form.

It was necessary to develop disaggregated data for each year covered by the study. The operating principle was that greater specificity in the data would reduce the likelihood of errors in the calculation of nutrient content. Such data included the shares of processed and fresh foods in certain categories and the proportions of the specific foods in each basic category. For example, the various types of fish and seafoods included in the general category of "fish" and the

[4] Harvesting losses consist of output left in the field at harvesttime or lost in transporting the harvested output to the point of weighing or recording. These amounts are not recorded as gross output.

[5] Slaughter fat as a percentage of slaughter weight without the hide is 5 percent for beef, 12 percent for pork, 8.5 percent for mutton and lamb, and 5 percent of the "other" category, which includes rabbit, horse, and reindeer. Poultry consumption was broken down by type, and fat content was calculated by type of poultry.

various types of flour included under the general category of "flour and other grain products" had to be determined. Then, as much as possible, item-specific data were developed or estimated: for example, quantities of milled wheat products in the food supply in the form of flour or groats were estimated. Each food item was then described in as much detail as possible so that nutrient values specific to that food could be assigned. For example, the various types of fish and the quantities sold whole, dressed, and filleted were estimated. When specific data could not be located—for example, oranges by varietal type—the procedure was to assign average nutrient values for all types that might be expected to be used in the USSR.

Following USDA practice, commercially produced alcohol and the grain and sugar used in alcohol production were not included in the food supply. No adjustments were made to Soviet food supply data for diversion of food products into home-brewed and home-distilled alcoholic beverages, although the extent of such diversion is probably larger in the USSR than in the United States.[4] This decision was made in accordance with the standard USDA practice of not applying discounts for losses occurring after the stage of processing and distribution at which food supply measurements are made.

Use of Soviet-derived nutrient values for the various foodstuffs was considered, but many unexplained differences in nutrient data were found.[5] These differences could not be attributed to measurement inconsistencies or to varietal and production differences. Nor were data available for all foods and nutrients. Therefore, in this study, the nutrient values for foodstuffs are those used by the USDA Human Nutrition Information Service. Food composition data were based on chemical analysis of food available in the United States, adjusted to take into account specific descriptions of Soviet foods. Discounts are made for refuse, such as bone in meat and fish, and rinds, peelings, pits, and seeds in fruit.

Evaluation of the Effects of Imperfect Data

We believe that the adjusted data have, on the whole, allowed us to accurately identify trends. Confidence in the data for individual years is somewhat lessened by our inability to fully account for Soviet losses of foods at some stages between the farm and retail outlet in the USSR, primarily in transport and manufacturing. The Soviet system of wages and bonuses encourages underreporting of losses, but we lack sufficient data to accurately calculate the differences between reported and actual losses. Although the Soviet press frequently reports large-percentage losses of fruits and vegetables, for example, these reports generally do not define at what points losses occur before or after the stage at which the Soviets measure the food supply. We believe, however, that our methodology captures a large portion of these losses

We consider our measurements of the Soviet food supply in its disaggregated form to be sufficiently accurate for comparison with the US food supply in an assessment of their respective nutrient contents. To the extent that error exists in the results, it likely stems from some overestimation of the Soviet food supply because of our inability to calculate all losses.

[4] In the USSR, alcohol consumption per person 16 years and older, if Soviet statistics on alcohol consumption are used, amounts to 130 to 140 calories per day. Vladimir G. Treml, in *Alcohol in the USSR: A Statistical Study* (Durham, N.C.: Duke University Press, 1982), has calculated amounts of pure alcohol consumption per person 15 years and older for a series of years. Using these estimates, the amount of alcohol consumed (excluding homemade wine and beer) would equate to 220 to 230 calories per day per person 16 years and older in 1979. These amounts include some distilled spirits illegally produced in households from foods included in per capita consumption of food. Sugar, sugar beets, grain, flour, bread, and potatoes are used in the illegal production of distilled spirits. Treml believes that the illegal production of distilled spirits results almost entirely from the use of refined sugar. Using the high end of the range for the amount of sugar Treml estimates is used to produce distilled spirits in households, we estimate that about 7 kg of sugar per capita could have been diverted from the food supply at the household level that year. This amounts to 75 calories per day per capita, or slightly over 2 percent of the per capita per day caloric level for 1978 and 1980 calculated in this study. Because the estimates of the consumption of illegally produced distilled spirits are subject to considerable uncertainty and because the estimates of materials used in that portion of alcohol consumption arising from illegal production are subject to even more uncertainty, the net impact upon nutrition levels cannot be calculated with reasonable certainty. For example, if one were to assume that potatoes rather than sugar were the major raw material used in illegal household production of distilled spirits, the level of ascorbic acid and some other vitamins not present in sugar would decrease in the food supply. If one were to assume sugar beets were the primary raw material used, then no nutrient loss would occur, because sugar beets (unlike table beets) are considered to be a "technical crop," are used in the industrial production of starch and sugar, and are not counted as part of the food supply. In the United States, consumption of alcohol per person 15 years and older amounted to between 180 and 190 calories per day (not including nontaxed production of alcoholic beverages) in 1979.

[5] USDA Agricultural Research Service Agriculture Handbook (and subsequent revisions), No. 8, *Composition of Foods*, 1975, and USSR Academy of Medical Sciences, *Khimicheskiy sostav pishchevykh produktov, pishchevaya promyshlennost'*, Moscow, 1977.



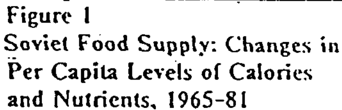
Table 1
USSR Food Supply: Levels of Nutrients and
Food Components Per Capita Per Day, Selected Years

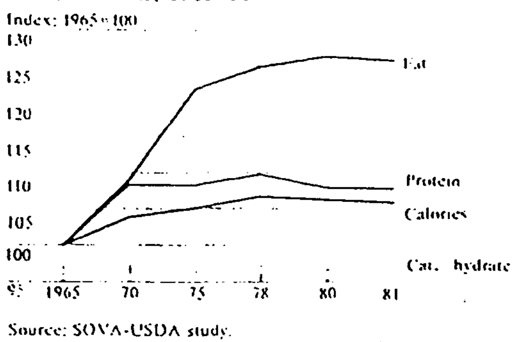
	1965	1970	1975	1978	1980	1981
Food energy (calories)	3,065	3,183	3,221	3,271	3,258	3,248
Protein (gm)	91.0	98.6	98.6	99.9	98.3	98.2
Fat (gm)	82.1	89.6	100.0	102.5	103.7	103.3
Carbohydrate (gm)	499.8	505.0	491.1	496.6	492.1	490.6
Calcium (mg)	589	802	738	788	760	761
Phosphorus (mg)	1,530	1,696	1,646	1,673	1,632	1,629
Zinc (mg)	11.0	12.1	12.3	12.4	12.2	12.1
Iron (mg)	15.4	15.6	15.7	15.6	15.4	15.4
Magnesium (mg)	427	445	430	429	420	418
Pantothenic acid (mg)	6.78	7.36	7.30	7.39	7.25	7.24
Thiamin (mg)	1.92	1.95	1.92	1.90	1.85	1.84
Riboflavin (mg)	1.66	1.97	1.99	2.06	2.01	2.01
Niacin (mg)	19.56	19.73	20.07	19.97	19.61	19.52
Folacin (mcg)	254	269	266	267	266	266
Vitamin C (mg)	124	127	123	126	125	125
Vitamin A (IU)	4,223	4,900	5,202	5,357	5,790	5,808
Vitamin B_6 (mg)	2.09	2.13	2.11	2.12	2.06	2.05
Vitamin B_{12} (mcg)	4.68	5.98	6.55	6.73	6.63	6.55
Cholesterol (mg)	265.5	326.9	392.0	406.0	412.8	414.3
Total saturated fatty acid (gm)	29.6	33.9	37.6	38.2	38.3	38.0
Oleic acid (gm)	23.2	25.7	29.4	29.9	30.2	30.0
Linoleic acid (gm)	18.9	18.4	20.7	21.9	22.5	22.6
Total monounsaturated fatty acid (gm)	25.8	28.8	32.8	33.3	33.6	34.4
Total polyunsaturated fatty acid (gm)	20.5	20.4	22.6	23.7	24.5	24.6
Fiber (gm)	7.43	7.63	7.30	7.12	6.94	6.96

Source: Nutrient data calculated by Human Nutrition Information Service, US Department of Agriculture, based on data provided by the Office of Soviet Analysis.

This upward bias, however, appears to be within reasonable bounds and does not seriously affect the results. As explained earlier, neither are all losses in the US food supply captured

In using the data presented on food availability and nutrient content, the reader must observe that the figures shown represent average nutrient levels on a per capita per day basis for the USSR as a whole. They do not indicate the differences that exist in the diets of different population groups, which preliminary research indicates are substantial.


Figure 1
Soviet Food Supply: Changes in Per Capita Levels of Calories and Nutrients, 1965-81



Source: SOVA-USDA study.

Changes in the Calorie and Nutrient Content of the Soviet Food Supply

Between 1965 and 1981 the per capita calorie level of the Soviet food supply increased by 6 percent, the protein level increased by 8 percent, and the carbohydrate level declined by 2 percent. Particularly striking was the 26-percent increase in the per capita daily level of fat and the 56-percent increase in cholesterol (table 1 and figure 1).

The trends for the major nutrients within the period studied also varied considerably. Most of the changes occurred in the 1965-75 period. The per capita level of calories rose through 1978 and then declined slightly in the final two years examined in the study, mostly as the result of decreases in the use of milk and milk products, grain products, and potatoes. The most rapid rise in the calorie level occurred during 1965-70. This period also accounted for nearly all of the rise in the protein level, which subsequently remained at the 1970 level with only small fluctuations, although the share of protein contributed by animal products continued to increase through 1980. The level of carbohydrates also increased in the 1965-70 period by a slight amount and then began to fall also with some fluctuations. The level of fat held to a steadier pattern, rising through 1980 with only a minor decrease in 1981; it too, however, rose most rapidly in the early years of the study, 1965-75. The level of cholesterol rose throughout the period of the study, with the rise also being most pronounced in 1965-75. The higher rate of increase in the cholesterol level is accounted for by steady and substantial increases in the availability of eggs, which are high in cholesterol content.

Per capita calorie levels exceeded Soviet recommended levels of ingestion for adults by over 200 calories in 1965 and by nearly 400 in 1981. Thus, if losses between measurement of nutrient levels in the food supply and nutrients in food as ingested did not exceed 200 to 400 calories, then the food supply provided sufficient energy on a per capita basis to meet the Soviets' recommended level of intake for adults. The Soviet per capita calorie levels also exceed current US recommended allowances for adult men and women—allowances that are considerably lower than Soviet recommendations (table 2).

Per capita levels of protein in the Soviet food supply for the period studied were within the Soviet recommended range of intake for adults. As with calories, Soviet per capita protein levels now nearly match US levels (table 3). During the period covered by this study, the sources of protein in the Soviet food supply have changed markedly, with a greater share now coming from livestock products (figure 2). The share of protein in the food supply from livestock products has increased from one-third to nearly one-half—still well below the 70-percent share in the US food supply.

Although the per capita level of carbohydrate in the food supply decreased by 2 percent over the period, it exceeded the US level of 391 grams per capita per day by 25 percent in 1981. While the supply of per capita of flour, other cereal products, and potatoes was falling, the supply of sugar has increased and is much closer to the US levels than in 1965.

Table 2
United States and the USSR: Recommended Dietary Allowances for Adults [a]

	United States		USSR [b]
	men [c]	women [c]	
Calories	2,400 to 2,900	1,800 to 2,100	2,850
Protein (*grams*)	56 [d]	44 [d]	80 to 100
Fat (*grams*)	NA	NA	80 to 100
Carbohydrate (*grams*)	NA	NA	400 to 500
Calcium (*milligrams*)	800 to 1,200	800 to 1,200	800 to 1,000
Phosphorus (*milligrams*)	800 to 1,200	800 to 1,200	1,000 to 1,500
Zinc (*milligrams*)	15	15	10 to 15
Iron (*milligrams*)	10 to 18	10 to 18	15
Magnesium (*milligrams*)	350 to 400	300	300 to 500
Pantothenic acid (*milligrams*)	4 to 7	4 to 7	5 to 10
Thiamin (B_1) (*milligrams*)	1.2 to 1.5	1.0 to 1.1	1.5 to 2.0
Riboflavin (B_2) (*milligrams*)	1.4 to 1.7	1.2 to 1.3	2.0 to 2.5
Niacin (*milligrams*)	16 to 19	13 to 14	15 to 25
Folacin (*micrograms*)	400	400	200 to 400
Vitamin C (*milligrams*)	60	60	50 to 60
Vitamin A (*international units*)	5,000	4,000	5,000 to 8,000
Vitamin B_6 (*milligrams*)	2.0 to 2.2	2.0	2 to 3
Vitamin B_{12} (*micrograms*)	3.0	3.0	2.0 to 5.0
Vitamin D (*international units*)	200 to 400	200 to 400	100 to 400

[a] Values for adults in the United States defined as 15 to 75 years. Definition of adult was not included in Soviet source. US Recommended Dietary Allowances (RDAs) are the levels of intake of essential nutrients adequate to meet the known nutritional needs of practically all healthy persons. Setting RDAs (except for energy) to ensure that the needs of nearly all in the population are met means that the allowances will exceed the requirements of most individuals. Soviet recommended nutritional levels are also made on this basis. Therefore, intakes below the recommended allowance for a nutrient are not necessarily inadequate, but the risk of having an inadequate intake increases as intake is reduced from the level recommended as safe.

[b] Per average adult.

[c] US recommended daily energy intake for adults given here are the midpoints of the ranges recommended for men and women. The ranges given here include the midpoints of the recommended daily energy allowances for men and women in the age categories of 15 to 18, 19 to 22, 23 to 50, and 51 to 75.

[d] Based on recommended 0.8 gm of protein per kilogram of body weight and assumed body weight of 70 kg for men and 55 kg for women.

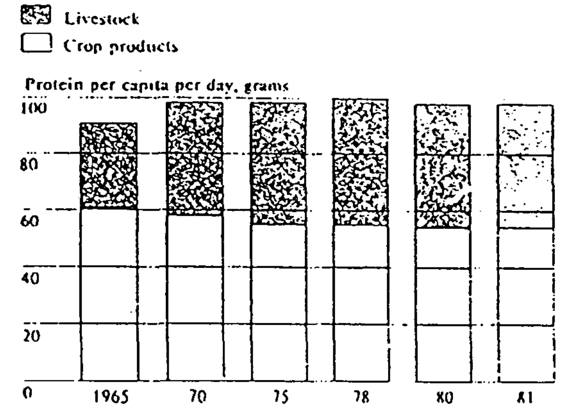
Sources: For the United States, Committee on Dietary Allowances, Food and Nutrition Board, National Research Council, *Recommended Dietary Allowances*, Ninth Revised Edition, National Academy of Sciences, Washington, D.C., 1980. The Committee on Dietary Allowances of the Food and Nutrition Board of the National Academy of Sciences periodically updates and reissues the authoritative *Recommended Dietary Allowances*. For the USSR, USSR Academy of Medical Sciences, *Khimicheskiy sostav pishchevykh produktov*, Moscow, 1977.

Table 3
US Food Supply: Levels of Nutrients and Food Components Per Capita Per Day, Selected Years

Year	1965	1970	1975	1978	1980	1981	1982
Food energy *(calories)*	3,190	3,330	3,260	3,340	3,410	3,410	3,380
Protein *(gm)*	96	100	99	100	100	100	99
Fat *(gm)*	150	160	152	158	163	164	162
Carbohydrate *(gm)*	370	379	380	387	392	391	388
Calcium *(mg)*	916	897	874	884	896	874	884
Phosphorus *(mg)*	1,493	1,513	1,485	1,493	1,499	1,477	1,473
Zinc *(mg)*	11.8	12.3	12.2	12.2	12.1	12.0	12.0
Iron *(mg)*	15.9	16.9	16.9	16.9	16.8	16.8	16.6
Magnesium *(mg)*	334	336	336	333	333	330	331
Thiamin *(mg)*	1.84	1.95	1.97	2.07	2.16	2.12	2.07
Riboflavin *(mg)*	2.21	2.26	2.28	2.35	2.36	2.30	2.28
Niacin *(mg)*	22.3	24.0	24.6	25.8	25.7	25.8	25.6
Folacin *(mcg)*	267	275	283	280	284	282	283
Vitamin C *(mg)*	95	107	117	116	120	117	118
Vitamin A *(IU)*	7,500	7,900	7,800	7,700	7,600	7,700	7,800
Vitamin B_6 *(mg)*	1.82	1.97	1.96	1.98	2.00	1.97	1.97
Vitamin B_{12} *(mcg)*	8.9	9.6	9.2	9.0	9.0	9.1	8.7
Cholesterol *(mg)*	523	526	484	487	490	486	479
Total saturated fatty acids *(gm)*	55.3	55.1	51.2	53.2	53.7	54.1	54.1
Oleic acid *(gm)*	61.0	65.6	61.8	62.6	64.3	64.8	64.5
Linoleic acid *(gm)*	17.7	21.8	22.4	24.4	25.2	25.7	25.5
Fiber *(gm)*	4.1	4.1	4.2	4.1	4.1	4.1	4.1

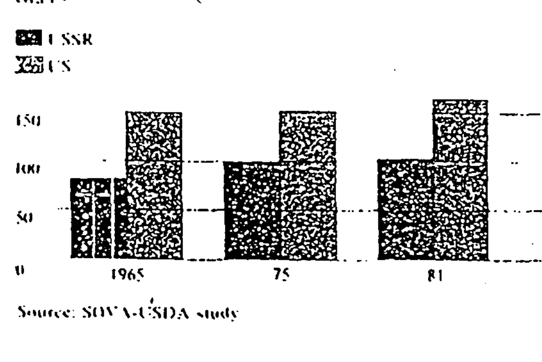
Source: *National Food Review*, Winter, 1984, and unpublished data; Quantities of nutrients are computed by Human Nutrition Information Service, Consumer Nutrition Division, US Department of Agriculture, on the basis of estimates, prepared by the Economic Research Service, of per capita civilian food consumption (retail weight). No deductions are made in nutrient estimates for loss or waste of food in the home, use for pet food, or for destruction or loss of nutrients during the preparation of food. Data include estimates of home garden produce and iron, thiamin, niacin, and riboflavin added to flour and cereal products; other nutrients added primarily as follows: Vitamin A to margarine, milk of all types, flavored milk extenders; Vitamin B_6 to cereals, meal replacements, infant formulas; Vitamin B_{12} to cereals; ascorbic acid to fruit juices and drinks, flavored beverages and dessert powders, flavored milk extenders, and cereals.

Figure 2
Protein in the Soviet Food Supply: Amounts Contributed by Crop and Livestock Products, 1965-81



Source: SOVA-USDA study.

Figure 3
USSR and US: Levels of Fat in the Food Supply, 1965, 1975, and 1981



Source: SOVA-USDA study.

The per capita levels of vitamins and minerals (with the exception of calcium) for most of the period studied were at or exceeded Soviet or US recommended dietary allowances (RDAs) for adults. The per capita level of calcium did not reach either the Soviet RDA or the US RDA for the period studied, and was below that in US per capita food supply levels. The level of vitamin A, which remained below the Soviet RDA, was below the US RDA in 1965, improved significantly by 1970, and by 1975 exceeded the US RDA. It remained below US per capita food supply levels for the period. The per capita level of folacin was well below the US recommended allowance, but within Soviet recommended allowances for the period. However, per capita levels of folacin in both food supplies were nearly equal for the period. The per capita level of riboflavin was at or above the US RDA for most of the period, but only reached the higher Soviet RDA in 1978. It remained below the per capita level of riboflavin in the US food supply for the period. The per capita level of zinc was within the Soviet RDA range but did not reach the US RDA during the period studied. Nonetheless, it was close to the per capita level of zinc in the US food supply for the period. Large differences in the per capita level of magnesium, niacin, and vitamin B_{12} in the two food supplies should also be noted.

In connection with the availability of vitamins and minerals in the food supply, it is important to reemphasize that if the food supply is to provide recommended levels of nutrient intake, it must exceed recommended levels of intake. As noted earlier, by how much the food supply needs to exceed RDA depends on losses of food and nutrients after food supply measurements are made.

The per capita level of fat in the Soviet food supply increased by 26 percent over the period, from 82.1 grams in 1965 to 103.3 grams in 1981. The per capita level of cholesterol in the food supply increased by 56 percent, from 265.5 milligrams in 1965 to 414.3 milligrams in 1981.[a] Although these were rapid increases, especially when viewed against US patterns,

[a] Cholesterol, a fatlike substance, generally is produced by the human body in sufficient quantities to meet the body's needs, but it is also present as a natural component of diets containing foods of animal origin. It is necessary in the formation of several substances, such as vitamin D and hormones. Another important function is as part of the covering of nerve fibers.



Table 4 *Percent*
Fat in the Soviet Food Supply: Shares Contributed by Major Food Groups

	1965	1970	1975	1978	1980	1981
Meat, poultry, fish	23.4	24.0	25.9	24.9	24.8	24.9
Eggs	2.4	2.9	3.5	3.6	3.7	3.8
Dairy products	14.7	21.0	17.5	18.5	17.4	17.3
Fats and oils (includes butter)	50.4	43.9	46.0	46.2	47.5	47.3
Citrus fruits •						
Noncitrus fruits	0.3	0.3	0.3	0.3	0.3	0.3
Potatoes	0.4	0.3	0.3	0.3	0.2	0.2
Dark green/deep yellow vegetables	0.1	0.1	0.1	0.1	0.1	0.1
Other vegetables	0.3	0.3	0.3	0.3	0.3	0.3
Legumes and nuts	0.5	0.6	0.6	0.6	0.5	0.5
Grain products	7.6	6.6	5.6	5.3	5.2	5.2

• Less than 0.05 percent.
Source: Nutrient data calculated by Human Nutrition Information Service, US Department of Agriculture, based on data provided by the Office of Soviet Analysis.

Note: Numbers may not add to 100 because of rounding.

per capita levels of fat and cholesterol in the Soviet food supply are still below US levels (figure 3).[illegible] Large increases in the Soviet per capita supply of meat, vegetable oil, and especially eggs in 1965-81 are responsible for the sharp increase in per capita level of fat and—with respect to the animal products—cholesterol (tables 4 and 5).

The share of fat in the Soviet food supply is still well below the US share, but the gap has narrowed since 1965, when the share of caloric intake from fat was 24 percent, and that in the US diet was 42 percent (figure 4).

[illegible] In the United States, the level of total fat in the food supply has increased about 30 percent since the beginning of the century, rising from 124.5 to 164 grams per capita per day from 1909-13 to 1981. The cholesterol level of the US food supply, however, has fluctuated considerably during this century. It reached its lowest level of 464 milligrams per capita per day in 1917 and again in 1935. Its peak level of 596 milligrams per capita per day occurred in 1945. Since then the level of cholesterol in the food supply has fluctuated downward to 479 milligrams per capita per day in 1982. *National Food Review*, Winter 1984

Table 5 *Percent*
Cholesterol in the Soviet Food Supply: Shares Contributed by Major Food Groups

	1965	1970	1975	1978	1980	1981
Meat, poultry, fish	33.2	31.1	30.6	29.5	29.3	29.1
Eggs	36.9	38.5	43.6	44.8	45.8	46.8
Dairy products	16.0	20.3	15.5	16.2	15.1	15.0
Fats and oils (includes butter)	13.9	9.9	10.3	9.5	9.8	9.2

Source: Nutrient data calculated by Human Nutrition Information Service, US Department of Agriculture, based on data provided by the Office of Soviet Analysis.

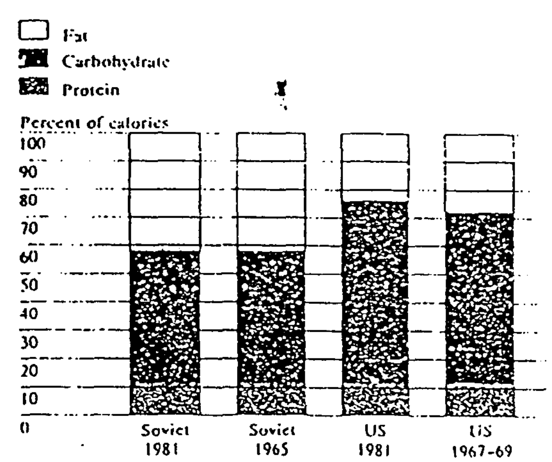
Note: Numbers may not add to 100 because of rounding.

Consumer Satisfaction

The findings of this study indicate that the Soviet food supply on an average per capita basis has long been generally adequate from a nutritional point of view. These findings, however, do not mean that the consumer is satisfied with the diet. Nearly half of the calories in the Soviet food supply are in the form of grain products and potatoes. One-fourth of the calories are in this form in the US food supply. Over the last two decades, growth in discretionary income and the maintenance of low retail prices, along with greater awareness of the better availability of foods in the West and in some East European countries, have increased Soviet consumer demand for high-quality foods. Although the composition of the Soviet food supply has changed somewhat to reflect consumer preferences, the Soviet Union has not solved the economic problem of providing a food supply that matches consumer preferences. The imbalances between the supply of and demand for most livestock products and some other quality foods are manifested in queuing and black marketing.



Figure 4
US and Soviet Food Supplies: Sources of Energy (Calories)



Source: SOVA-USDA study and "Nutrient Content of the National Food Supply, 1981," *National Food Review*, Winter, 1983.

Health Implications of Trends in Nutrient Levels

Declines in Soviet life expectancy have raised many questions about the quality of life and lifestyle of the Soviet population. Life expectancy for males, after reaching a high point of 67 years in 1964, has declined to 62 years in 1983; life expectancy for females, after reaching a high point of 76 years in 1964, was 74 years in 1983. Soviet statistics show large increases in the rates of death attributed to cardiovascular diseas : and cancer during this period.

Although estimation of the specific impact of trends in nutrient levels in the food supply upon disease and death rates in the Soviet Union is outside the scope of this paper, some implicit risks to health can be identified in general terms. Although the Soviet diet conforms more to consumer desires now than it did two decades ago, not all of the changes have been necessarily beneficial to health maintenance. Western medical research in recent years has accumulated evidence of certain linkages between diet and disease. The relatively high level of caloric availability and the rapid growth in fat and cholesterol levels in the Soviet food supply may be of interest to researchers investigating these changing mortality patterns.

Calorie Levels

Although the calorie level of the Soviet food supply increased 6 percent between 1965 and 1981, it is not possible to judge the adequacy of intake from food supply data. According to the Soviet journal *Questions of Nutrition*, however, nearly 50 percent of Soviet adults are overweight, and the incidence of obesity is increasing both among adults and children.[10] Obesity has been associated with an increased risk of developing major health problems, including coronary heart disease.

Fat Intake

A diet that contributes to high blood concentrations of cholesterol is generally considered to be an important risk factor associated with coronary heart disease. Other high-risk factors include genetic background, smoking, and hypertension.[11] A high fat diet has also been associated with some forms of cancer. The relationships between diet and coronary heart disease, and between diet and cancer, and the interrelations

[10] *Voprosy pitaniya*, No. 3, 1983.
[11] The desirable amounts of fat, fatty acids, and cholesterol in the diet are subjects of considerable controversy. However, the American Institute for Cancer Research issued guidelines in early 1984 recommending that Americans reduce their intake of dietary fat. The guidelines were based on evidence linking diets high in fat with heart disease and some forms of cancer. The American Heart Association currently recommends that the intake of fat for Americans should not contribute more than 30 percent of dietary energy. Dietary guidelines issued in 1980 by the US Department of Agriculture and the US Department of Health, Education, and Welfare recommended avoiding too much fat. In 1980 the Committee on Dietary Allowances of the Food and Nutrition Board of the National Academy of Sciences, in issuing the 9th revised edition of the authoritative *Recommended Dietary Allowances*, did not make a blanket recommendation for dietary change for the entire population but suggested that individuals consider reducing intake of fat so that it does not contribute more than 35 percent of dietary energy. The Committee stated that a diet containing 15-25 grams per day of appropriate food fats is adequate, but set no specific requirement for fat as a nutrient in the diet.



between diet, other risk factors, and these diseases appear to be highly complex and are the subject of much current research.[12]

According to the Soviet statistics, in the last two decades cardiovascular disease (which includes coronary heart disease, stroke, hypertension, and rheumatic fever) has become the leading cause of death in the USSR. The crude death rate from cardiovascular disease rose by 71 percent from 1965 to 1981. Death rates from cardiovascular disease have increased nearly twice as fast as overall mortality increases. The limited data available suggest that much of this increase can be accounted for among men of prime able-bodied ages.[13] The crude death rate from cancer in this period increased 15 percent.

Some Western epidemiologists postulate that the Soviet Union has in effect joined the "coronary lifestyle club," developing trends in mortality and morbidity that have occurred earlier in more affluent societies. With economic development and with a gradual rise in the level of living, the Soviet population is increasingly turning to foods that symbolize the "good life" but earlier were in much shorter supply. Increased consumption of those foods (many of which are high in animal fats), combined with other trends such as increased use of cigarettes and alcohol, they suggest, appears to be leading to the increased incidence of coronary heart disease and cancer.[14]

[12] Joint US-USSR research in exploring some of these relationships has resulted in the following publications: US-USSR Steering Committee for Problem Area I: The Pathogenesis of Atherosclerosis. "Collaborative US-USSR study on the Prevalence of Dyslipoproteinemias and Ischemic Heart Disease in American and Soviet Populations," *American Journal of Cardiology*, 1977; 40:260-8; US-USSR Steering Committee for Problem Area I (The Pathogenesis of Atherosclerosis): Population Descriptions and Methodology for the Collaboration in Problem Area I. In: USA-USSR First Lipoprotein Symposium: Leningrad, USSR May, 26-27, 1981. Bethesda, MD: US Department of Health and Human Services. 1982. NIH Publication No. 83-1966; and US-USSR Steering Committee for Problem Area I: The Pathogenesis of Atherosclerosis. "Nutrient Intake and its Association with High-Density Lyproprotein and Cholesterol in Selected US and USSR Subpopulations," *American Journal of Clinical Nutrition*, 1984; 39:942-952.
[13] *Vestnik statistiki*, Nos. 11 and 12, various years.
[14] See Richard Cooper, M.D., and Arthur Schatzkin, M.D., M.PH., "Recent Trends in Coronary Risk Factors in the USSR," *The American Journal of Public Health*, May 1982, Vol. 72, No. 5; Richard Cooper, M.D., "Rising Death Rates in the Soviet Union," *The New England Journal of Medicine*, 304; No. 21, 1981; John Dutton, Jr., "Changes in Soviet Mortality Patterns, 1959-1977," *Population and Development Review*, 1979, No. 5.

Soviet plans for 1990 call for an increase over 1981 of nearly 25 percent in per capita consumption of meat, a 50-percent increase for vegetable oil, and 10-percent increases for eggs and milk. Although not all these goals will be met, the per capita consumption of eggs and milk in 1990 will likely meet and possibly exceed plans, and some increase in meat and vegetable oil consumption is likely. Hence, cholesterol and fat levels are likely to continue on their upward trend.

Other Health Conditions That May Be Related to Diet

In general, the use of food supply data to imply levels of nutrient intake and then to associate intake with the incidence of disease has serious drawbacks. As indicated earlier, to provide recommended levels of nutrients for ingestion, per capita levels of nutrients in the food supply must be higher. How much higher cannot be stated, since the degree of loss before ingestion is unknown.

Still, the finding of this study that the per capita level of calcium in the Soviet food supply for the period studied is below both US and Soviet RDAs for adults may be of interest to researchers studying Soviet health trends. Also noteworthy are the findings stated with regard to vitamin A, riboflavin, folacin, zinc, and vitamin B_{12}.

A finding of average per capita levels of nutrients above the RDA for a large population does not, of course, provide information about the distribution of food and nutrients among population groups or individuals and therefore does not rule out the possibility that certain groups within a population are receiving inadequate amounts of certain nutrients.[15] Indeed, Soviet medical literature indicates that nutritional deficiencies exist among some subgroups in the population and that, in some cases, these nutritional deficiencies have led to deficiency diseases.

[15] In the United States, for example, the first Health and Nutrition Examination Survey (NHANES), conducted in 1971-74, found dietary deficiencies among certain groups. Among the deficiencies, iron was the most frequent, affecting particularly young children and women of childbearing age. The survey collected data through dietary surveys, physical examinations, and clinical tests.

Soviet medical literature suggests, for example, that the prevalence of rickets (a vitamin D deficiency disease)[14] among children, especially infants—particularly in the southern and Central Asian republics—may be considerably greater than in the United States, where it was virtually eliminated decades ago.[15] The Soviet literature also suggests that nutritional anemia among children is common in some areas.[16]

For example, in early 1981 a pediatrician in Kazan' (in the Russian republic) stated that, although rickets "has lost the features of a social illness" in the Soviet Union, this problem "nevertheless continues to trouble pediatricians and attract the attention of researchers."[17] Additional evidence of rickets and anemia in children in both cities and rural areas has surfaced.[18] Taken together, this material suggests that these deficiency diseases were occurring in the 1960s and 1970s and are still occurring in some regions in the USSR. The Soviets do not publish information on the incidence of those diseases.

Rickets in infants may result from the inadequate supply of infant formula, the lack of supplemental vitamin D for nursing infants, and insufficient exposure to sunlight.[19] Among older children, it may result from insufficient exposure to sunlight in combination with inadequate intake of food products containing vitamin D.

[14] Although rickets can be caused by other factors, it is most often caused by a vitamin D deficiency. In the absence of vitamin D, mineralization of bone matrix is impaired, resulting in rickets in children and osteomalacia in adults. The exact requirement for vitamin D has not yet been established. Although vitamin D can readily be formed by the action of sunlight on the skin, the amount formed is dependent on a number of variables, including length and intensity of exposure and color of skin. (*Recommended Dietary Allowances*, Ninth Revised Edition, National Academy of Sciences, Washington, D.C., 1980.) In some northern areas of the USSR, children are provided with ultraviolet light treatments to prevent rickets.

[15] While some pediatric texts now label rickets as a pediatric relic in the United States, it continues to be seen in the pediatric age range among certain susceptible subgroups that include very premature infants, those on long-term anticonvulsant therapy, those with malabsorptive diseases, and some strict vegetarians with little or no vitamin D intake. In 1927 it was discovered that the plant sterol ergosterol acquired the property of curing rickets when irradiated with ultraviolet light. This compound, ergocalciferol (called Vitamin D2), has been added to almost all milk sold in the United States and Western Europe and has been responsible for the almost complete disappearance of rickets in the United States over the past 40 years. "Vitamin D Deficiency Rickets in American Children," *Comparative Therapy*, July 1981.

[16] Although many nutrients are involved in the production of red blood cells and hemoglobin, iron deficiency is by far the most common cause of nutritional anemia all over the world. In certain sections of a population, especially pregnant women, folate deficiency is also an important cause. Even in developed countries certain sections of the population, such as premature infants, preschool children, and pregnant women, are particularly at risk; in developing countries the problem is much more widespread and serious (*Bulletin of the World Health Organization*, No. 56 [5], 1978). In the United States, the Ten-State Nutrition Survey revealed that, for children under 36 months of age, iron was the only nutrient for which mean intakes were generally below recommended daily allowances (USDHEW, 1972). The first NHANES survey has provided additional evidence of intakes below the recommended daily allowances at all income levels and among all races (*The American Journal of Clinical Nutrition*, June 1978.)

[17] "Reshennye i nereshenniye voprosy rakhita," *Pediatriya*, No. 2, 1981.

[18] A study published in 1982 of the "actual diet and health status" of children in Kazakhstan reported the following: "Various forms of nutritional disturbances and diseases caused by them were found. The most widespread finding was a shortage of essential amino acids—lysine, methionine, and threonine—and vitamins A, C, and the B group. Rickets, hypotrophy, anemia, and obesity were often encountered among the diet-related diseases. A direct correlation was established between incidence of diseases, in which the nutritional factor is dominant, and infectious-inflammatory diseases that are the greatest cause of child mortality." *Vestnik Akademii meditsinskikh nauk SSSR*, No. 11, 1982. A study of child mortality for 1974 in Azerbaijan noted that a "rather high child mortality affects the republic's general mortality rate" and blamed poor medical care, specifically "weak prophylaxes for rickets." *Azerbaijanskiy meditsinskiy zhurnal*, No. 9, 1976. A study in Kazakhstan in the early 1980s of the physical development and general health of babies fed on different infant formulas, using breast-fed babies as controls, found that 12 percent of the breast-fed babies developed "diseases of the endocrine system," nutritional and metabolic disorders including rickets, and that 25 percent developed "alimentary anemia." Of the infants fed on formulas, the percentages developing the first category of problems ranged from 11 to 42 percent, no further figures were given for anemia (*Zdravookhraneniye Kazakhstana*, No. 2, 1983). In a study conducted in the mid-1970s of 3,016 families in Leningrad with children up to 7 years of age, 450 families were found with children suffering from chronic illnesses; of these children, 8.6 percent suffered from "rickets and hypertrophy" (*Zdravookhraneniye Rossiyskoy Federatsii*, No. 8, 1979). In a study conducted of the medical records of 514 children up to age 3 who had died in the city of Sumgait in Azerbaijan in 1970-72, rickets was retroactively diagnosed in over 100 cases; the researchers believed that rickets was a significant contributing cause of death in many of these cases. In seven cases, anemia was diagnosed as the cause of death. *Azerbaijanskiy meditsinskiy zhurnal*, No. 4, 1975. A medical examination of children in 10 cities of the USSR conducted in 1969-71 found a large number of chronic diseases requiring treatment, including rickets and anemia. (*Pediatriya*, No. 2, 1980.)

[19] Soviet mothers often use cow's milk or powdered milk reconstituted with water to feed their infants. Most milk and milk products in the Soviet Union are not fortified with vitamin D. Infant formula is still not produced in needed quantities in the Soviet Union, although much progress has been made.



Soviet Concern Over Nutritional Inadequacies

Soviet nutritional researchers have found the intake of various vitamins and minerals to be inadequate among some population and age groups in certain regions. The concern among Soviet medical authorities was clear at an all-union conference on nutrition sponsored by the Presidium of the Academy of Medical Sciences in late 1981. The report of the conference stated that, "Despite significant progress in rationalizing the diet, the problem of an insufficient supply of certain vitamins to selected groups in the population remains serious. Studies of various occupational groups among the population in a number of regions in the country have revealed insufficient intake of ascorbic acid, thiamin, riboflavin, and niacin."

The conference recommended more research on the intake of vitamins A, C, B, B_{12}, D, E, and folacin among preschool and school-age children, older students, pregnant and nursing women, and certain unspecified occupational groups in Siberia, Central Asia, the Far East, and the North.[22] Soviet medical journals regularly discuss the problem of anemia in women of childbearing age, suggesting that it is a widespread problem.

Differences in the intake of various nutrients leading to nutritional inadequacies among certain subpopulations have many causes. A major factor is the substantial variation in availability of various food products and per capita food supply levels among regions in the USSR. The Ukraine and Belorussia have the highest per capita calorie levels with the Central Asian republics trailing well below the average levels for the USSR. The differences can be attributed to income levels, preference (which varies among ethnic groups), climate (calorie requirements tend to be somewhat less in southern regions), age structure (per capita caloric levels are lower in groups with higher proportions of infants and children), and regional differences in production. For example, in 1975 per capita use of meat in Estonia was 80 kilograms (kg), with per capita production at 115 kg, while in Uzbekistan per capita use of meat was 31 kg, with per capita production at only 18 kg. In 1981 the per capita use of fruit in the Siberian area of the Russian republic was 12 kg, while in the Russian republic as a whole per capita use of fruit was 40 kg.[23]

In addition, the marked seasonal fluctuations in the availability of certain foods, in large part a result of marketing and distribution problems, may cause significant variations in the food supply levels of some nutrients. Fresh vegetables and fruit are often unavailable for purchase in the winter and early spring. Researchers from the Institute of Nutrition, USSR Academy of Medical Sciences, are beginning to study the effects of these seasonal variations.[24]

The effects of the regional and seasonal variations on intake of certain foods among population subgroups could be ameliorated if food were more widely distributed or if foods were enriched. Although a joint party-state resolution issued in 1960 ordered systematic enrichment of several basic foodstuffs, very little is being done. For example, only a tiny share of industrially processed milk in the Soviet Union is fortified with vitamin D. Soviet authorities, not unaware of the importance of food enrichment, plan large increases in the output of enriched food products, especially for children.

Outlook

The nutrient content of the Soviet food supply will continue to change as livestock products and other foods become more available. Soviet consumer preferences for livestock products and some other quality

[22] The conference report complained that "not enough" was being done to carry out earlier party-state and ministerial decrees on food fortification. *Voprosy pitaniya*, No. 4, 1982.

[23] *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 6, 1982; *Narodnoye khozyaystvo RSFSR v 1981 g. Statisticheskiy yezhegodnik*, Moscow, *Tsentral'noye statisticheskoye upravleniye RSFSR*, 1982.

[24] *Voprosy pitaniya*, No. 3, 1983. Nutritional sciences are the responsibility of the Academy of Medical Sciences (AMS) of the USSR. This academy is governed by a presidium whose members comprise the elite of Soviet medical sciences. There are numerous medical research institutes under the control of the AMS. Among the AMS institutes is the Institute of Nutrition in Moscow, which is the central and lead institute for all nutrition research in the USSR. The Institute of Nutrition has a branch located in Alma Ata, Kazakhstan.

Table 6
USSR and United States: Per Capita Availability of Selected Foods, 1981

Kilograms

	Meat [a]	Fish	Eggs	Fruit	Sugar [b]	Potatoes
USSR	53	18	14	42	44	105
United States	110	8	15	64	36	35

[a] Meat for the USSR and the United States excludes slaughter fat and includes edible offals.
[b] If all other sweeteners are included (sweeteners other than sugar are not available for general consumption in the USSR) the figure for the United States would be 64.

Sources: *Narodnoye khozyaystvo SSSR, 1982; Food Consumption Prices and Expenditures,* 1962-82.

foods are still far from satisfied; per capita availabilities of these foods generally do not match US levels (table 6 and figure 5). The intake of meat, dairy products, vegetable oil, sugar, and some fruits and vegetables will increase slowly as the availability of these products increases. The overall result will likely be a continued rise in the levels of fat and protein in the food supply and a fall in carbohydrates. The declines in carbohydrates, however, are not likely to offset the increases in calories contributed by protein and fat in the food supply. Per capita calorie levels will probably climb slowly upward through the 1980s. Preliminary estimates indicate the per capita calorie level in 1983 was higher than in 1981.

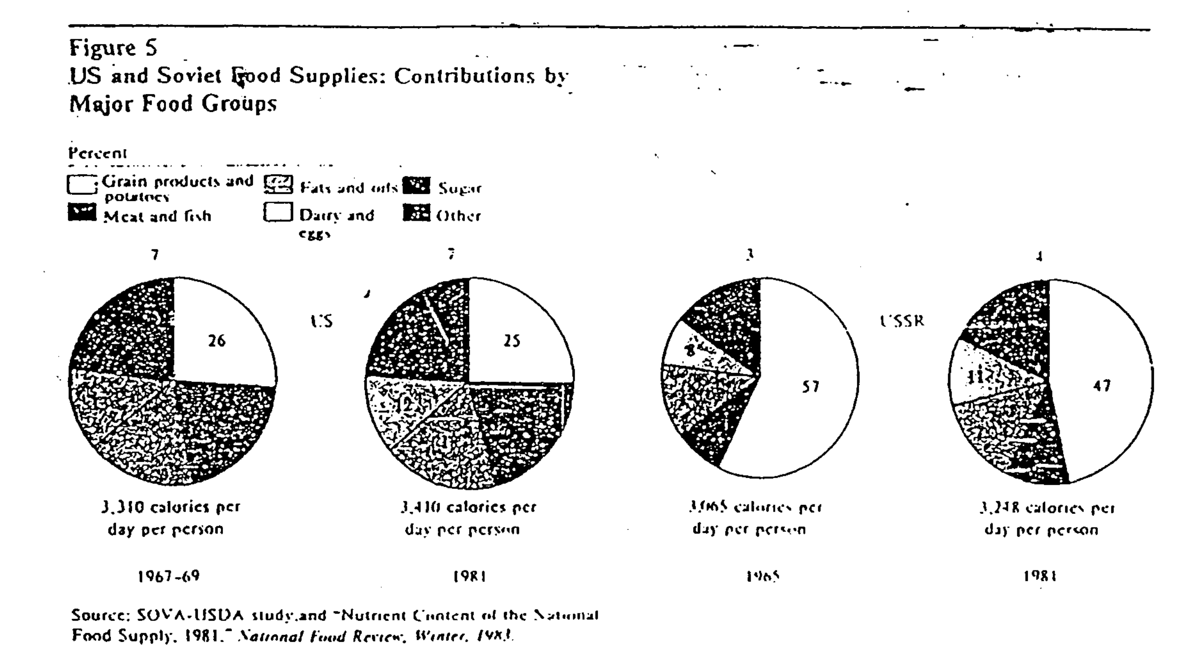
Some steps the Soviets could take to improve nutrition and lessen regional discrepancies in nutrient levels could well involve conflicts between public health considerations and the goal of increasing consumer satisfaction. Controlling the level of fat in the food supply, for example, could require a rethinking of the policy of providing more high-fat livestock products to consumers, as well as an effort to provide more low-fat industrially processed products. Limiting the rise in caloric levels could be partially achieved by stopping growth in sugar availability, but this would also result in consumer dissatisfaction. Similarly, to carry out the policy of lessening the gaps in the availability of certain foods among regions involves difficult choices under present conditions. Either a sharp increase in the general availability of these foods would have to be provided through expensive imports, or a redistribution of available supplies of these foods between the "have" and "have-not" regions would have to be effected.

Other measures could improve nutrition, however, without involving politically difficult choices. Such measures include encouraging breast-feeding and producing more infant formula for those who choose not to breast-feed, increasing the vitamin fortification of foods such as milk and flour, expanding the output of processed foods (particularly fruits and vegetables), and improving the storage and transportation of foods. The Soviets are making efforts in all these areas.

Although the nutritional content of the Soviet diet is now closer to that of the US diet than it was in 1965, Soviet consumers still do not enjoy substantial access to the quantity and variety of fresh and processed food products that the US consumer has. This is particularly true with respect to meat and fruit. The US consumer, in fact, appears to have reached the saturation point in consumption of meat (excluding poultry) and eggs; indeed, per capita consumption of these items has been in decline for several years. Soviet per capita increases in consumption of several foods will continue, but at slow rates.

Finally, the findings that the per capita levels of calories, protein, and most food components in the Soviet food supply are close to or exceed Soviet RDAs suggest that a strategy of eliminating waste and spoilage to increase the proportion of agricultural production reaching the consumer is sound. The food supply is basically adequate in nutrient levels and could be augmented through loss reduction. Indeed, a primary objective of the Soviet Food Program is to reduce losses in the vertically integrated food production complex. An investment approach aimed at reducing losses in harvesting, transport, and storage, and at raising the efficiency of food processing would probably therefore be more cost effective in increasing

Figure 5
US and Soviet Food Supplies: Contributions by Major Food Groups



Source: SOVA-USDA study and "Nutrient Content of the National Food Supply, 1981." *National Food Review, Winter, 1983.*

the nutrient content of the food supply than a strategy of increasing gross agricultural output, especially given the very high cost of expanding production on Soviet farms.

Nonetheless, the primary objective of the Food Program is to increase the output of nearly all agricultural commodities. The current production of some foods, notably meat and fruit, is still not sufficient to satisfy consumer preferences even if all losses between farm and consumer are eliminated. Moreover, population growth necessitates production growth simply to maintain per capita availabilities, and a declared goal of the Soviet leadership is to reduce if not eliminate food imports.

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